

REMARKS

Claims 38 – 61 remain in this application. Claims 38, 39, 41, 44 – 51, and 58 – 61 have been amended. Reconsideration of this application in view of the amendments noted is respectfully requested.

Independent claim 38 has been amended to more clearly define the present invention. In particular, claim 38 has been amended to make clear that (1) the cladding is of a hard-wearing material and is provided by the welding wire material, which is melted onto the substrate to form the cladding; (2) the substrate is cylindrical and is rotated about a horizontal axis; (3) the welding gun is moved relative to the cylindrical substrate parallel to the horizontal axis; (4) the welding gun is mounted in a position below the uppermost level of the surface of the cylindrical substrate; and (5) the welding wire is melted to provide molten hard-wearing material on the surface of the rotating cylindrical substrate at a location below the uppermost level of the surface of the rotating cylindrical substrate such that the molten material is moved upwards by the rotation of the cylindrical substrate. Independent claim 47 has been amended in a similar manner. Support for these amendments can be found at least on pages 10 – 14 of the specification and FIGS. 3 – 5 of the drawings.

Dependent claims 39, 41, 44 – 46, 48 – 51, and 58 – 61 have been amended to be consistent with the amendments to the independent claims and to clarify the directions of motion by defining them with respect to the horizontal axis that is now defined in the independent claims.

In the Office Action, claims 38 – 61 were rejected under 35 U.S.C. 103(a) as being unpatentable over Browne et al. (U.S. Patent No. 5,362,937, hereinafter “Browne”) in view of Nadeau et al. (U.S. Patent No. 4,733,051, hereinafter “Nadeau”) and Carpenter et al. (U.S. Patent No. 2,427,350, hereinafter “Carpenter”). Applicant respectfully traverses these rejections.

With respect to independent claims 38 and 47, the Office Action appears to rely on Browne to show all the features of the independent claims, except for the feature that the substrate is cylindrical and rotated, and then to combine the teaching of Browne with that of

Nadeau, which the Office Action considers to show the substrate being cylindrical and rotated.

However, there are further differences between Browne and the present invention now claimed in claims 38 and 47 than simply the fact that the substrate is cylindrical and rotated. In particular, the feature that the welding gun is moved relative to the cylindrical substrate parallel to the horizontal axis is not disclosed in Browne. Neither is the feature that the welding gun is mounted in a position below the uppermost level of the surface of the cylindrical substrate, nor that the welding wire is melted to provide molten hard-wearing material on the surface of the rotating cylindrical substrate at a location below the uppermost level of the surface of the rotating cylindrical substrate such that the molten material is moved upwards by the rotation of the cylindrical substrate. Clearly, none of these features could be disclosed or fairly suggested in Browne, since Browne has a planar substrate, not a cylindrical, rotating one. Indeed, Browne clearly teaches away from cylindrical rotating substrates, as is made clear in column 1, lines 16 – 32. Thus, one of ordinary skill in the art would not attempt to use the methods described in Browne with a cylindrical substrate. Even if one of ordinary skill did try to use those methods on a cylindrical, rotating substrate, one of ordinary skill would not be taught the various features mentioned above, which are not disclosed in Browne. And Nadeau and Carpenter fail to remedy these deficiencies.

Further, applicant submits that one of ordinary skill in the art would not combine the disclosure of Nadeau with the disclosure of Browne. The method and system disclosed in Browne is used for providing a metal cladding onto a metal plate substrate (see column 1, lines 1 – 2). The cladding is produced by melting the weld metal onto the substrate to overlay the substrate with the weld metal. Clearly, this overlaying is done over substantially the whole surface of the substrate, whether using one or more weld guns. Both the present invention and Browne are related to welding for purposes other than joining, for example built-up welding. Nadeau, on the other hand, relates to controlling welds in open butt joints (see title), such as welding together to join two pipes to make a longer one. There is no cladding formed on the substrate (the pipe). The type of welding occurring in Nadeau is completely different from that of Browne. As explained above, in Browne substantially the

whole surface of the substrate is covered with molten material to form a cladding. In Nadeau, on the other hand, the welding is used purely to butt join two cylindrical substrates together. There is no disclosure in Nadeau of the use of a cylindrical substrate to be clad. One skilled in the art of weld cladding would be unlikely, therefore, to look at the butt joining arts.

Thus, Browne teaches *away* from the use of cylindrical substrates, so there is no reasonable expectation of success to apply the disclosure of Browne to cylindrical substrates. Further, one of ordinary skill in the art would not have a reasonable expectation of success in combining a different art (that of butt joining disclosed in Nadeau) with Browne, which relates to welding for purposes other than joining, e.g. built-up welding.

Furthermore, even if Browne were to be combined in some way with Nadeau, the combination would not result in the presently claimed invention, since neither Nadeau nor Browne discloses moving a welding gun relative to a cylindrical substrate parallel to the horizontal axis.

Finally, the Office Action relies on the disclosure of Carpenter as showing the formation of a sheet into a cylinder, which is rotated around a horizontal axis with cladding being applied by arc welding at the surface of the substrate. Aside from the fact that the substrate in Carpenter is a metal pipe (see title), or retort member, and there is no description of the pipe having been formed from a sheet, the cladding in Carpenter is formed by electric fusion of a granular flux that flows from a hopper to the fusion zone (see column 4, line 72 to column 5, line 1). For similar reasons to those stated above, one skilled in the art would not have a reasonable expectation of success in combining this old method of forming a cladding by electric fusion of a powder as disclosed in Carpenter when considering the disclosure of Browne. Even if the two were combined, the combination would not result in the presently claimed invention, since neither Browne nor Carpenter discloses that a welding gun is mounted in a position below an uppermost level of the surface of a cylindrical substrate, so that the welding wire is melted to provide molten hard-wearing material on the surface of the rotating cylindrical substrate at a location below the uppermost level of the surface of the

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rotating cylindrical substrate such that the molten material is moved upwards by the rotation of the cylindrical substrate.

For all of these reasons, independent claims 38 and 47 are patentable over any possible combination of Browne with Nadeau and Carpenter. Claims 39 – 46, depending from claim 38, and claims 48 – 61, depending from claim 47, are also patentable. Accordingly, applicant respectfully requests that the Section 103(a) rejection of claims 38 – 61 as being unpatentable over Browne in view of Nadeau and Carpenter be withdrawn.

This amendment and request for reconsideration is believed to be fully responsive to the comments and suggestions of the examiner and to place this application in condition for allowance. Further, this amendment should be entered as it places the application in condition for allowance or in better form for appeal. No further search or consideration is required. Favorable action is requested.

Respectfully submitted,

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